Indiana STEM Plan
High Level Outline

Vision

- **IDOE Vision:** The Indiana Department of Education is committed to excellence and opportunity.

- **Indiana STEM Vision:** Provoking inspiration and innovation within all Indiana students through daily robust, inquiry-based, real-world and workforce responsive STEM education will energize, engage and connect Hoosiers while positively impacting communities.

Mission

- **IDOE Mission:** The Indiana Department of Education advocates for students, supports districts and schools with guidance and resources, and leads the K-12 ecosystem.

- **Indiana STEM Mission:** To provide high quality STEM education to every Indiana student, every day.

Indiana STEM Education Belief Statement

- Indiana STEM Education will:
    - result in the skills and mindsets that open the door for lifelong learning
    - start as early as preschool
    - span the K-12 spectrum
    - be culturally responsive
    - employ real-world problem and inquiry based approaches to learning
    - engage students in hands-on activities
    - encourage the teacher to facilitate the learning
    - authentically engage the problem-solving process

- offer opportunities for students and educators to interact with STEM professionals
- support career awareness opportunities
- align to the goals of Career & Technical Education
- align to the needs of business & industry

Framework

- The framework for our strategic action plan is defined by:
    1) Theory-of-Action - TBD
    2) Recommendations, Goals & Strategic Activities
    3) A System of Public/Private Governance - TBD
    4) Complimentary Funds and Resources - TBD
    5) Timeline for Results

Theory of Action

- TBD

Recommendations, Goals & Strategic Activities

RECOMMENDATION ONE:
INVEST IN ATTRACTING, TRAINING & RETAINING STEM EDUCATORS

Goal #1: By investing in the recruitment, development and retention of STEM educators, Indiana will increase the number of STEM ready educators by a minimum of 10% by 2025.

STRATEGIC ACTIVITY 1.1: Attracting STEM Educators

- **STEM Educator Recruitment Campaign**: Support a new recruitment campaign for prospective science, technology, math and engineering educators.

- **Pre-Service Training**: Develop and disseminate exemplary STEM methodology, curricula and instructional practices to all Indiana teacher preparatory institutions.

- **Licensure, Endorsements & Incentives**: Establish quality STEM-related teacher preparatory guidelines and attach targeted license endorsements, supported by financial incentives for educators determined to be highly-qualified instructors.

- **Industry Career Changers**: Target STEM professionals/retirees from business and industry to consider a second career as a STEM educator, through flexible alternative licensing and financial incentives for those determined to be highly-qualified instructors.

STRATEGIC ACTIVITY 1.2: Training STEM Educators

- **Professional Development**: All elementary school teachers will have the opportunity to be trained in evidence-based, STEM pedagogy in conjunction with the rollout and ongoing support of the state math and science standards. All secondary schools will offer opportunities for STEM training for teachers instructing related content areas.

- **Computer Science Educator Training**: Integrate computer science educator training into STEM training options for K-12 teachers, and prioritize STEM and computer science training initiatives in competitive grant funding opportunities.

- **Monitor and Evaluate STEM Trainings**: Implement a system of periodic reviews of state STEM-related professional development practices, monitor effectiveness, and use findings to inform necessary adjustments.

STRATEGIC ACTIVITY 1.3: Retaining STEM Educators

- **STEM Teacher Mentors:** Develop a STEM mentor-teacher model to support classroom teachers' effective use of STEM instructional practices. Identify incentives for highly-effective teachers who serve as STEM mentors.

- **STEM Cohorts:** Develop statewide cohorts of STEM educators to promote community-building, share best practices and grow regional STEM innovators to sustain and retain local talent and identified leaders.

- **STEM Educator Externships**: Identify opportunities to prioritize and financially support nontraditional participation in STEM Educator Externships.

RECOMMENDATION TWO:
IMPLEMENT EVIDENCE-BASED STEM CURRICULUM IN EVERY SCHOOL IN INDIANA AND RECOGNIZE SCHOOLS FOR EXCELLENCE IN STEM INSTRUCTION AND STUDENT ACHIEVEMENT

Goal #2: Increase science proficiency for all students in 4th and 6th grade by 10 percentage points and increase math proficiency by 10 percentage points for all students in grade 3-8 by 2025.

Strategic Activity 2.1: Curriculum & Instruction

- **Integrated, Standards-based, Project/Inquiry-based Curriculum**: Implement a seamless integration of State and nationally recognized curriculum incorporating new State math and science standards within STEM instructional practices and career exploration applications.

- **Resources for Access to Evidence-based STEM Curriculum**: Provide resources to schools for the integration of evidence-based or nationally vetted curriculum in classrooms, with the emphasis on K-6 learning environments and computer science initiatives.

- **Digital STEM Learning:** Scale up digital access to high quality STEM education in order to assist in remedying inconsistent course availability and providing equitable access for all Indiana students.

- **Research and Surveys to Identify Best Practices for Scale:** Implement comprehensive research and analysis of STEM education in Indiana including the use of surveys to provide evidence of impact of STEM activities occurring in classrooms across the state.

Strategic Activity 2.2: STEM School Certification

- **STEM Certification Process**: Reevaluate the IDOE STEM Certification process with the goal of establishing an aligned, robust, but accessible application for all Indiana schools.

- **Increase STEM Certified Schools**: Triple the number of elementary STEM certified schools, as measured by the updated STEM certification requirements by 2025.

- **Curriculum Alignment**: All STEM certified schools must use evidence-based or nationally vetted STEM curriculum by 2020 as determined by the Indiana Department of Education.

- **Standards Updates & Integration**: Effectively integrate K-12 STEM curriculum, aligned to math & science standards, to support effective practices for use by classroom instructors.

Strategic Activity 2.3: Recognition and Achievement

- **Assessments:** Increase science proficiency for all students in 4th and 6th grade by 10 percentage points and increase math proficiency by 10 percentage points for all students in grades 3-8th by 2025.

- **Recognition of Achievement:** Recognize top performing STEM certified schools and students.

RECOMMENDATION THREE: SUPPORT EFFECTIVE SCHOOL-COMMUNITY PARTNERSHIPS TO STRENGTHEN THE STEM EDUCATION TO CAREER PIPELINE

Goal #3: By nurturing effective school-community partnerships within K-12 education programs across the State and aligning education to business and industry needs, we will strengthen the education to career pipeline as evidenced by a 10% growth rate of the number of secondary students entering into STEM related career pathways and in the matriculation of high school graduates to STEM related careers or postsecondary fields of study by 2025.

Strategic Activity 3.1: Strategic Partnerships

- **Scale up Successful School-Business Partnerships:** Replicate existent programs that have successfully catalyzed school-business partnerships to strengthen the STEM career pipeline, through the collaborative efforts of IDOE, Department of Workforce Development, and regional business organizations (such as Chambers of Commerce), to connect more schools to businesses.

- **DWD & IDOE Collaboration:** Utilize workforce development boards to coordinate, support and monitor robust school to business STEM-focused partnerships.

- **Information & Data Sharing:** Develop the ability to access and exchange information across the State regarding STEM partnerships in order to track outcomes and support partnership creation and development.

- **Higher Education Institutions**: Utilize higher education institutions as hubs for innovation and partnership managers in local communities and workforces.

- **Time for Teacher-to-Business Partnerships:** Schools leaders, from state level to individual schools, will create incentives for teachers to build partnerships – e.g., create space in the workday for teachers who want to reach out to the private sector.

- **Instructional Incentives for External Learning:** School leaders should provide instructional incentives for teachers to use community resources for the integration of K-12 classroom learning and external-based learning opportunities, focusing on project-based, hands on learning and career applications.

Strategic Activity 3.2: Career Readiness

- **Source Local Businesses for Workforce Needs:** School leaders should coordinate with local businesses to design student STEM externships, aimed at solving local problems being taught with STEM curriculum in the classroom to promote hands-on learning linking to career exposure.

- **Work-Based Learning, Externships & Partnerships:** Invest in the creation and sustainability of partnerships for student externships and hands-on, work-based learning opportunities.

- **Out of School Activities with Link to STEM Jobs**: Support after-school programs and enrichment that includes hands-on learning, career exposure and working with STEM technical experts to enhance the continuum of learning outside of the classroom.

- **Modification of School Days and Calendars**: School days and calendars should be modified to embrace rather than discourage STEM programming with business—for example, class period lengths that permit outings, flexible scheduling that allows for assemblies around business matters, time built in for job shadowing, opportunities for business leaders to teach classes, the integration of subjects such as chemistry and economics to model real-world experience, etc.

Monitoring & Evaluation

- TBD

System for Governance

- TBD

Complimentary Funds & Resources

- TBD

Timeline for Results

- The Timeline for Results will highlight currently approved and funded STEM initiatives for the first version of this plan. Bi-annual evaluations of the plan will include phased implementations of new policies, best practice programs and initiatives based upon available funding and resources.

- Metrics from our strategic action plan will be evaluated on an annual basis, with recommendations for interventions for scale made bi-annually during the evaluation phase before state legislative budget years.

- Timeline Graph: